REMARKS

Claims 1-21 were pending in this application. Applicant amends claim 1 as shown on the attached sheets and cancels method claims 18-21 without prejudice. Accordingly, claims 1-18 are now pending. The cancellation of claims 18-21 is done to expedite prosecution in view of the restriction requirement imposed in Office Action of December 26, 2002. Applicant reserves the right to pursue the prosecution of the cancelled claims in future divisional or continuing applications.

Support for the amendment to claim 1 can be found throughout the specification and, among other places, at page 5, line 3. Thus, no new matter is added.

Applicant thanks the Examiner for reconsideration of this application in the Office Action of December 26, 2002 and for the withdrawal of all but one of the grounds for rejection. In light of the amendment to claim 1 and the following remarks, the application is now believed to be in condition for allowance. Hence, reconsideration and allowance of the application are respectfully requested.

The Invention

The present invention provides photosensitive resist materials, useful in lithography, that include colloidal particles which significantly increase the plasma etch selectivity of the photoresist materials. There are two independent claims presented in this application. Independent claim 1 recites a photoresist composition that includes a resin binder and an encapsulated inorganic material having core particles with an average size less than about 10 nanometers. Independent claim 15 similarly, recites a photoresist composition that includes a resin binder and an encapsulated inorganic material having core particles with an average size ranging from about 1 nm to about 50 nm. Both independent claims now specify that the photoresist composition is *base soluble upon activation by radiation.*

Rejection Under 35 U.S.C. 103

The Office Action rejects claims 1-17 as obvious in view of U.S. Patent No. 6,114,083 of Kawamura. Applicant respectfully traverses this rejection for the reasons provided below.

Kawamura describes a radiation-sensitive planographic printing plate that includes a support on which a photosensitive layer is formed. More particularly, Kawamura is directed to printing plates that can be utilized for printing after exposure "*without a need for complete wet development process* ...," and without generating "*alkaline developer waste solution* ..." See Col. 1, lines 26-32. The photosensitive layer of Kawamura includes a polymer compound that becomes hydrophilic upon exposure to heat or acid generated, for example, by a photo-acid generator. Kawamura's compositions rely upon a hydrolytic polymerizable compound that functions as a cross-linking agent. Kawamura's photosensitive layer can further include a plurality of water insoluble particles.

A heat sensitive record can be directly applied to Kawamura's compositions, or alternatively, the plate can be exposed to laser radiation to selectively cause portions of the composition to undergo crosslinking reactions (and thereby become hydrophilic). Subsequently, the printing plate can be processed with water, if necessary. The areas moistened with water will not accept lithographic ink. The areas which accept ink form the printing image areas, generally hydrophobic areas, and the ink rejecting areas form the background areas, generally hydrophilic areas. The processing with water, however, does not cause removal of any portion of the photosensitive layer. In fact, Kawamura explains that the photosensitive layer "is not dissolved off at processing." See col. 43, lines 5-14, col. 42, lines 30-35. In other words, processing or development with water, as used in Kawamura, is not intended to include removal of the processed portions by dissolution. Hence, there is no teaching or suggestion in Kawamura regarding dissolving an exposed portion of the photosensitive layer by water or, alternatively, by a basic solution.

In contrast, both amended independent claim 1 and independent claim 15 expressly recite

that the photosensitive resist compositions are *base soluble upon activation by radiation*. Accordingly, these claims, and the claims dependent thereon distinguish patentably over Kawamura.

CONCLUSION

In view of the above amendments and remarks, Applicant respectfully requests allowance of the application. If there are any remaining issues, we invite the Examiner to call the undersigned at (617) 439-2514.

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Respectfully submitted,

By _____

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Clean Copy of Pending Claims

B1

1. (Twice Amended) A positive photosensitive resist composition comprising a resin binder and an encapsulated inorganic material comprising core particles having an average size less than about 10 nanometer, wherein the photoresist is base soluble upon activation by radiation.

2. The positive photosensitive resist composition of claim 1, wherein the binder is a t-butyl blocked polyvinyl phenol.

3. The positive photosensitive resist composition of claim 1, wherein the binder is a polyvinylphenol and t-butyl acrylate copolymer.

4. The positive photosensitive resist composition of claim 1, wherein the binder is a polyvinylphenol, t-butyl acrylate and styrene terpolymer.

5. The positive photosensitive resist composition of claim 1, wherein the binder is a DNQ novalak binder.

6. The positive photosensitive resist composition of claim 1, wherein the encapsulated inorganic material is silicon dioxide.

7. The positive photosensitive resist composition of claim 1, wherein the encapsulated inorganic material is aluminum oxide.

8. The positive photosensitive resist composition of claim 1, wherein the encapsulated inorganic material is titanium oxide.

9. The positive photosensitive resist composition of claim 1, wherein the content of the encapsulated inorganic resist material is between about 0.1% and about 90% by weight of the positive photosensitive resist composition.

10. The positive photosensitive resist composition of claim 1, wherein the content of the encapsulated inorganic material is between about 5% and about 75% by weight of the positive photosensitive resist composition.

11. The positive photosensitive resist composition of claim 1, wherein the content of the encapsulated inorganic material is between about 20% and about 50% by weight of the positive photosensitive resist composition.

12. The positive photosensitive resist composition of claim 1, wherein the binder and the encapsulated inorganic material form a clear positive photosensitive resist composition.

13. The positive photosensitive resist composition of claim 1, further comprising a surfactant.

14. The positive photosensitive resist composition of claim 1, further comprising a solvent.

15. A positive photosensitive resist composition comprising a resin binder and an encapsulated inorganic material comprising core particles having an average size ranging from about 1 nm to about 50 nm, wherein the photoresist is base soluble upon activation by radiation.

16. The positive photoresist composition of claim 15, wherein the average size of the particles ranges from about 1 to about 20 nm.

17. The positive photoresist composition of claim 1, wherein the encapsulated inorganic material further comprises core particles having an average size less than about 5 nm.